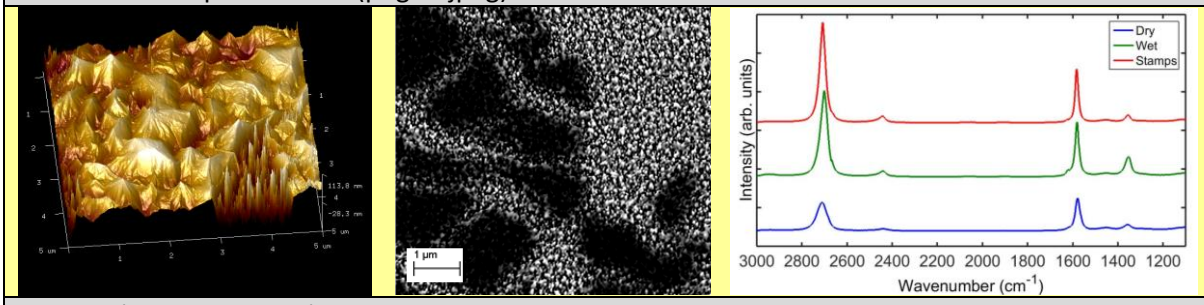
Graphene transfer on highly corrugated black silicon surface

Plakhotnyuk, Maksym; Shvets, Violetta; Whelan, Patrick Rebsdorf; Mackenzie, David; Bøggild, Peter; Hansen, Ole

Publication date:
2015

Title of the abstract
Graphene transfer on highly corrugated black silicon surface
Name (Your name as you want it displayed on the website and in the book of abstracts)
Maksym M. Plakhotnyuk, Violetta Shvets, Patrick R. Whelan, David M.A Mackenzie, Peter Bøggild, Ole Hansen
Your affiliation
Department of Micro- and Nanotechnology, Technical University of Denmark, Denmark
Abstract text (max 200 words)
The 2D material graphene has a great promise for applications in photonics and electronics, due to its unique optical, electrical, mechanical, thermal and chemical properties. Investigation of graphene properties on rough nanotextured surfaces can give rise a new unique application of graphene. Graphene on highly corrugated surfaces can exhibit properties like suspended graphene; however, its behavior on such surfaces is not well investigated. Graphene transfer to corrugated and nanotextured surfaces has only been investigated for antireflective and mechanical properties [1-3]. We present graphene transfer methods on highly corrugated black silicon surface. We show successful transfer of graphene monolayers with different transfer techniques (dry, wet and stamp methods) on black silicon surfaces (roughness 200-300 nm) and its adhesion to corrugated surfaces. AFM and SEM images show graphene monolayer flakes in the range on 1-5 µm on black silicon surfaces. Raman spectra confirm the presence of graphene on the black silicon samples.
References (If you have any references. Maximum 3.)
[1] Kumar, R., 2013, "Antireflection properties of graphene layers on planar and textured silicon surfaces.," Nanotechnology, **24**(16). [2] Gao, W., and Huang, R., 2011, "Effect of surface roughness on adhesion of graphene membranes," J. Phys. D. Appl. Phys., **44**(45), p. 452001. [3] Reserbat-Plantey, A., Kalita, D., Ferlazzo, L., Autier-Laurent, S., Komatsu, K., Li, C., Weil, R., Han, Z., Ralko, A., Marty, L., Guéron, S., Bendiab, N., Bouchiat, H., and Bouchiat, V., 2014, "Strain superlattices and macroscale suspension of Graphene induced by corrugated substrates," arXiv, pp. 1–28.
Insert research picture here (png or jpeg)

Mini CV (max 200 words)
Presenter: Maksym Plakhotnyuk is a PhD student at DTU Nanotech. His current field of research is heterojunction silicon photovoltaic cell and graphene application in photovoltaics. He received his M.S.

degrees in Microelectronics and Semiconductor Devices from Vinnytsia National Technical University, Ukraine (2007) and M.S degree in Electrical Engineering from University of Illinois (2013). He was awarded Fulbright Graduate Student Scholarship and University of Illinois Fellowship.

Insert your CV photo here (png or jpeg)